What is claimed is:

1.   A digital multimedia broadcasting (DMB) system, comprising:

5   an encoding means for encoding an audio/video signal;

a synchronizing means for synchronizing media stream, additional data, interactive service objectifying data that are outputted from the encoding means;

a multiplexing means for multiplexing the media
10   stream outputted from the synchronizing means;

an error correction encoding means for performing additional error correction encoding on the media stream outputted from the multiplexing means;

an interleaving means for removing temporal
15   correlation between adjacent byte units within a data stream outputted from the error correction encoding means; and

a transmitting means for transmitting a DMB media stream outputted from the interleaving means.
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2.   The system as recited in claim 1, wherein the audio/video signal is obtained by converting multimedia source data into data stream of a predetermined format through a preprocessing.
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3.   The system as recited in claim 1, wherein the encoding means includes a 'Moving Picture Experts Group (MPEG)-4 Part 2' codec or a 'MPEG-4 Part 10 Advanced Video Coding (AVC)' codec as a video encoder; and an 'Advanced
30   Audio Coding (AAC)' codec, an 'AAC+' codec, or a 'Bit Sliced Arithmetic Coding (BSAC)' codec as an audio encoder.

4.   The system as recited in claim 1, wherein the synchronizing means includes:

an Object Descriptor (OD)/Binary Format for Scene (BIFS) generating means for generating OD/BIFS for interactive service;

an Initial Object Descriptor (IOD) generating means for generating an IOD; and

a sync layer packetizing means for synchronizing media streams outputted from the encoding means and the OD/BIFS generating means.

5.   The system as recited in claim 4, wherein the multiplexing means includes:

a PES packetizing means for generating a Program Elementary Stream (PES) packet based on a packet outputted from the sync layer packetizing means;

a section packetizing means for generating a predetermined section based on a packet outputted from the sync layer packetizing means;

a Program Service Information (PSI) generating means for generating PSI based on data outputted from the IOD generating means; and

a transport stream (TS) packetizing means for packetizing data outputted from the PES packetizing means, the section packetizing means and the PSI generating means into transport stream.

6.   The system as recited in claim 1, wherein the error correction encoding means is utilized to satisfy the target Bit Error Rate (BER) performance of multimedia data, and the error correction encoding means uses an RS encoder and has a structure of an RS encoder (204, 188, t=8) substantially.

7.   The system as recited in claim 1, wherein the interleaving means is formed of 12 branches, and each

branch, which is formed of memories based on a 17-byte × N unit (N = 0, 1, 2, ..., 11), has input and output switches synchronized with each other, and a synchronization word for synchronization is transmitted always through a '0'

5   branch and the synchronization of a deinterleaver is obtained by allocating the first recognized synchronization word to the '0' branch.

8.   The system as recited in claim 1, wherein the
10   transmitting means utilizes a digital audio broadcasting system (DAB), a digital television (TV) broadcasting system, a digital satellite broadcasting system, and a digital cable broadcasting system.

15   9.   The system as recited in claim 1, wherein the transmitting means is cooperated with any one among the DMB system, an ensemble remultiplexer, an Ensemble Transport Interface (ETI) adapter, and an Ethernet adapter.

20   10.   The system as recited in claim 1, wherein the DMB system, which is based on the digital audio broadcasting (DAB) system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, and a digital cable broadcasting system, does not
25   include the error correction encoding means and/or the interleaving means according to system performance in a high-speed mobile channel environment.

11.   A digital multimedia broadcasting (DMB) method,
30   comprising the steps of:
      a) encoding video/audio data at a high efficiency for data compression;
      b) synchronizing a media stream encoded in the step a), a media stream for an additional data service, and a

media stream by an objectification for an interactive
service;

c) multiplexing a media stream synchronized in the
step b);

d) encoding and interleaving for correcting an error
to be occurred in a media stream multiplexed in the step
c); and

e) transmitting a stream interleaved in the step d).

12. The DMB method as recited in claim 11, wherein,
in the step a), preprocessed video signals are encoded by
using a 'Moving Picture Experts Group (MPEG)-4 Part 2'
encoder or a 'MPEG-4 Part 10 Advanced Video Coding (AVC)'
encoder; and preprocessed audio signals are encoded by
using any one among an 'Advanced Audio Coding (AAC)'
encoder, an 'AAC+' encoder, and a 'Bit Sliced Arithmetic
Coding (BSAC)' encoder.

13. The DMB method as recited in claim 11, wherein
the step b) includes:

b1) generating an Object Descriptor (OD)/Binary
Format for Scene (BIFS) for interactive service;

b2) generating an Initial Object Descriptor (IOD);
and

b3) packetizing the media stream for synchronizing
encoded media streams outputted from the steps a) to e) and
b1) and the OD/BIFS media stream.

14. The DMB method as recited in claim 11, wherein
the step c) includes the steps of:

c1) generating a Program Elementary Stream (PES)
packet based on a packet outputted from the step b3);

c2) generating a predetermined section based on a
packet outputted from the step b3);

c3) generating Program Service Information (PSI) based on data outputted from the step b2); and

c4) packetizing data outputted from the steps c1) to c3) into transport stream.

15. The DMB method as recited in claim 11, wherein, the error correction coding of the step d) is performed to satisfy the target Bit Error Rate (BER) performance of multimedia data, and a Reed-Solomon (RS) encoder is used for encoding the error correction code and a structure of an RS (204, 188, t=8) encoder is adopted substantially.

16. The DMB method as recited in claim 14, wherein, the interleaving of the step d) is formed of 12 branches, and each branch, which is formed of memories based on a 17-byte $\times$ N unit (N = 0, 1, 2, ..., 11), has input and output switches synchronized with each other, and a synchronization word for synchronization is transmitted always through a '0' branch and the synchronization of a deinterleaver is obtained by allocating the first recognized synchronization word to the '0' branch.

17. The DMB method as recited in claim 11, wherein, the step e) includes the steps of:

e1) establishing a transmission priority order with respect to a sub-channel for automatic formation of an Service Transport Interface (STI)/Ensemble Transport Interface (ETI) frame in the digital broadcastings system; and

e2) selecting a sub-channel based on the above-established sub-channel priority order and the STI/ETI input frame, determining whether transmission is possible, if transmission is impossible, searching a sub-channel that can be included in the remaining space of the STI/ETI frame,

including the selected sub-channel, and minimizing the remaining space in the STI/ETI frame to be outputted by repeating the process.

18. The DMB method as recited in claim 17, wherein, the transmission process of the step e) is performed in digital broadcasting system, such as, a digital audio broadcasting system, a digital TV broadcasting system, a digital satellite broadcasting system, and a digital cable broadcasting system.

19. The DMB method as recited in claim 18, wherein the DMB system based on the conventional digital broadcasting system is cooperated with any one among, an ensemble remultiplexer, an Ensemble Transport Interface (ETI) adapter, and an Ethernet adapter.

20. The DMB method as recited in claim 19, wherein the DMB system does not include the error correction encoding means and/or the interleaving means in a high-speed mobile channel environment such as the digital audio broadcasting system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, and a digital cable broadcasting system.

21. A computer-readable recording medium for recording a program that implement a digital multimedia broadcasting (DMB) method, which comprises the steps of:
a) encoding video/audio data at a high efficiency for data compression;
b) synchronizing a media stream encoded in the step a), a media stream for an additional data service, and a media stream by an interactive service objectification for an interactive service;

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c) multiplexing a media stream synchronized in the step b);

d) encoding and interleaving for correcting an error to be occurred in a media stream multiplexed in the step

5   c); and

e) transmitting a stream interleaved in the step d).